1959

1959-1960 Bulletin of Information - Graduate - Electrical & Mechanical Engineering

Seattle University

GRADUATE EVENING PROGRAM IN ELECTRICAL AND MECHANICAL ENGINEERING

SEATTLE UNIVERSITY

BULLETIN OF THE GRADUATE SCHOOL 1959-60

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SEATTLE 22, WASHINGTON

GENERAL INFORMATION

In the Fall of 1958 Seattle University began a program of graduate study leading to the Master of Science degree in Electrical Engineering or Mechanical Engineering. Because this program is subsidized by the Boeing Airplane Company, Boeing employees are given preference in registration. However, the program is open to others to the extent that the classes are not filled with Boeing employees.

In the school year 1959-1960, seven courses especially designed for this program will be offered, beginning in the Fall Quarter and continuing in the Winter and Spring Quarters. Each such course bears 3 quarter-hours credit per quarter. Descriptions of these courses will be found in this Bulletin. The courses offered will be varied from year to year.

The program is expected to be a permanent one; in any event, its continuation for at least four years is assured.

Students who are employed full time are permitted to take at most two courses per quarter. The minimum time for such students to complete the requirements for a Master's degree is estimated as three school years; the maximum time allowed is six years.

CLASSIFICATION OF STUDENTS

There are two classes of Engineering students in the Graduate School: (1) those who intend to earn a master's degree and (2) unclassified special students who already have a bachelor's degree but do not intend to earn a master's degree. Special students must follow the required admission procedures and perform satisfactory work in the courses for which they enroll. Ordinarily no credit earned by a special student will count toward a degree.

ADMISSION TO THE DEGREE PROGRAM

Admission to the degree program is granted to applicants who have received the bachelor's degree from an approved college or professional school and whose scholarship records and credentials indicate ability to pursue graduate work of a high caliber. An undergraduate major and minor or their fair equivalents are required in the same departments or areas from which the student selects his graduate work.

ADMISSION PROCEDURE

Correspondence concerning admission should be addressed to the Dean of the Graduate School. Application for admission should be submitted as early as possible before the opening of the term in which the student wishes to begin his work.

Prospective students must file with the Dean of the Graduate School the following:

1. Two copies of an official application form properly filled in. This form may be secured from the Registrar's Office.

2. Two official transcripts of academic credits, to be sent directly from each institution of higher learning attended.

A student is not regarded as a duly qualified Graduate Student until he has received a letter of acceptance from the Dean of the Graduate School.

ADMISSION TO CANDIDACY

Admission to candidacy for the master's degree is granted after the student has completed twenty (20) quarter-hours of his approved program of studies with no grade less than B in his major area.

REQUIREMENTS FOR MASTER'S DEGREE IN ENGINEERING

1. Each candidate shall complete 35 quarter-hours of course work at Seattle University beyond that required for a bachelor's degree and a thesis bearing 10 quarter-hours of credit, altogether, 45 quarter-hours. The work must be of distinctly advanced character but, with the approval of the department and the Graduate Council, fifteen (15) credits may be earned in courses number 300 to 499, if the subjects be suitable to the student's program and not required in the respective undergraduate curriculum at Seattle University. A maximum of ten (10) quarter-hours may be transferred from another institution if they are earned with a grade of A or B and approved by the Council.

2. Distribution of course work will be according to a program recommended by the department and approved by the Dean of the Graduate School.

3. All work done toward a master's degree must have a B grade or better, including undergraduate courses applied toward the degree. Undergraduate courses required but not applied toward the master's degree must have at least a C grade.

4. Every candidate for a master's degree must take a comprehensive examination embracing both the major and minor fields of study. This examination shall be written and/or oral at the judgment of the department and the approval of the Graduate Council. The examination in the minor field will cover the more significant phases of the particular subjects taken. This matter may be based on a list of readings assigned by the department.

5. The student is required to complete a thesis on a topic approved by both his major department and the Graduate Council. For this work 10 quarter-hours of credit are granted. The thesis is not necessarily a work of original research but it must, however, demonstrate the candidate's ability to collect facts, interpret them in a critical manner and organize and express them in an original, lucid way.

a. The topic of the thesis is to be approved by the student's mentor and filed with the Graduate school when thirty (30) quarter-hours of the graduate program have been completed.

b. Three copies of the approved thesis are to be filed in the Office

of the Dean of the Graduate School two weeks before the date of graduation.

c. An oral examination on the content of the thesis, cognate literature and available source material is held before a board appointed by the Graduate Council.

6. The course work for the master's degree must be completed within five (5) years after the candidate has been accepted for graduate studies. The comprehensive examination, the thesis and the thesis examination must be completed within one (1) year after the course of studies is finished.

7. There is no foreign language requirement in Engineering.

8. Each candidate for a degree is required to make application for it on the form supplied by the Graduate School office. This form, filled out, should be returned to the office not later than April 15, preceding the June in which the degree is expected.

9. The Graduate Council alone has the power to recommend a candidate to the Executive Board for a master's degree.

10. All candidates for degrees must be present at the Commencement Exercises to receive their diplomas.

FEES

Payable only once.

1. Application fee, paid with application for admission to the Graduate School $5.00
2. Matriculation fee, billed with first quarter's tuition, except to former students of Seattle University $5.00
3. Graduation fee $25.00
4. Master's comprehensive examination $10.00

Payable each quarter.

1. Registration fee $4.00
2. Library fee $1.00
3. Tuition . . . . . per quarter-hour . . $14.50
4. Student Building Fund assessment (applies to evening students registered for 5 or more quarter-hours) $2.00

BOOKSTORE

Textbooks and other school supplies can be purchased at the Broadway Bookstore in the basement of the Science Building. The Bookstore will be open every evening from 6 to 9 p.m. during the first few days of the quarter, and thereafter on Wednesdays and Thursdays from 7:30 to 8:30 p.m.

LIBRARY

Reference books and periodicals may be consulted in the Library on the third floor of the Liberal Arts Building and, with the exception of ready reference books and current periodicals, may be borrowed. The Library will be open evenings from 5:30 to 9:30 p.m., Mondays through Thursdays.

CALENDAR FOR THE SCHOOL YEAR 1959-1960

	FALL QTR.	WINTER QTR.	SPRING QTR.	
Registration for Boeing employees	Mon. Sept. 21	.....	.....	6:30 - 8:00 p.m.
	Tue. Sept. 22	.....	.....	6:30 - 8:00 p.m.
General registration	Th. Oct. 1	Th. Jan. 7	Th. Mar. 24	6:30 - 8:00 p.m.
	Fri. Oct. 2	Fri. Jan. 8	Fri. Mar. 25	6:30 - 8:00 p.m.
	Sat. Oct. 3	Sat. Jan. 9	Sat. Mar. 26	9:00 - 12:00 a.m. and 1:00 - 4:00 p.m.
Classes begin	Mon. Oct. 5	Mon. Jan. 11	Mon. Mar. 28	
Holidays	Wed. Nov. 11	Fri. Feb. 5	Fri. Apr. 15	
	Th. Nov. 26	Mon. Feb. 22	Mon. May 30	
	Fri. Nov. 27			
	Tue. Dec. 8			
Final day to withdraw officially	Th. Dec. 3	Th. Mar. 3	Fri. May 20	
Last day of classes	Fri. Dec. 18	Fri. Mar. 18	Tue. June 7	

Note: Examinations are held during regular class periods.

THESIS CONFERENCES

All students in the degree program should meet on Friday, October 9, 1959 from 6:00 to 7:00 p.m. to learn about thesis requirements so that they may begin thinking about their Theses - selecting suitable topics, and planning their thesis work - as soon as possible. The room in which the meeting will be held will be announced at registration. Several individual conferences with each student will be arranged for later dates.

PROGRAMS OF STUDY

The program of study of each graduate student will be worked out individually by the student and his mentor (the Head of the major department or some one delegated by the Head) and will be subject to the approval of the mentor. Mathematics 461, 462, and 463 will be required of all students pursuing the degree Master of Science in Engineering and will be prerequisite for some of the courses.

FURTHER INFORMATION

Please consult the Seattle University Bulletin of Information, 1959-1960, for additional information on Seattle University and its regulations. Regarding points not covered therein, please telephone or write E. W. Kimbark, Dean, School of Engineering, Seattle University, Seattle 22, telephone EAst 3-9400, extension 34.

DESCRIPTION OF COURSES

EE 501 CONTROL SYSTEMS I. An intensive study of linear feedback analysis, stability, and frequency methods, with emphasis on root-locus methods. Prerequisites: EE 486 (Transients) and Mt 341 (Differential Equations) or equivalents. Desirable but not required: EE 511 previously or concurrently. Credit: 3 q.h. Teacher: Rev. Francis P. Wood, S.J., M.S. Fall Quarter, 8:10 - 9:40 p.m., M-W, Room A117.

EE 502 CONTROL SYSTEMS II. Signal-flow graphs, synthesis of R-C networks, designs in the s-plane. Prerequisites: EE 501 and Mt 461. Desirable but not required: EE 511. Credit: 3 q.h. Teacher: Fr. Wood. Winter Quarter.

EE 503 CONTROL SYSTEMS III. Constraints and minimization of error, principles of statistical design, describing functions and phase plane. Prerequisite: EE 502. Credit: 3 q.h. Teacher: Fr. Wood. Spring Quarter.

EE 511 ADVANCED NETWORKS I. Brief review of sinusoidal steady-state network analysis. Network topology. Formulation and solution of the integrodifferential equations of linear, lumped-constant systems. Application of the complex frequency variable and Laplace transformations to network analysis. Prerequisite: graduate standing. Credit: 3 q.h. Teacher: Demetrios Vassilakos, Ph.D. Fall Quarter, 6:30 - 8:00 p.m., M-W, Room A117.

EE 512 ADVANCED NETWORKS II. Principles of network synthesis. Energy relations and physical realizability. Synthesis of two- and three-element networks for prescribed driving-point frequency response. Prerequisite: EE 511. Credit: 3 q.h. Teacher: Dr. Vassilakos. Winter Quarter.

EE 513 ADVANCED NETWORKS III. Network synthesis for prescribed transfer frequency response. Methods of approximation. Application of the conformal transformation and potential analogy to the design of communication networks. Elements of network synthesis in the time domain. Prequisite: EE 512. Credit: 3 q.h. Teacher: Dr. Vassilakos. Spring Quarter.

EE 521 APPLIED ELECTROMAGNETIC THEORY I. Introduction to Maxwell's field equations. General coordinate systems and the field tensors. Electrostatic and magnetostatic energy and the forces in static and dynamic fields. Boundary value problems in electrostatic fields. Prerequisite: graduate standing. Credit: 3 q.h. Teacher: Theodore Higgins, Ph.D. Fall Quarter, 6:30-8:00 p.m., T-Th, Room A118.

EE 522 APPLIED ELECTROMAGNETIC THEORY II. Boundary-value problems in static magnetic fields. The wave equation. The Laplace and Fourier transforms. Cylindrical waves and cylinder functions. The Hankel transform. Spherical waves. Prerequisite: EE 521. Credit: 3 q.h. Teacher: Dr. Higgins. Winter Quarter.

EE 523 APPLIED ELECTROMAGNETIC THEORY III. Radiation and boundary-value problems applied to radiation from antennas, propagation in wave guides, scattering and diffraction. Prerequisite: EE 522. Credit: 3 q.h. Teacher: Dr. Higgins. Spring Quarter.

EE 526 PULSE TECHNIQUES. Relationships between pulse shape and transmission characteristics of systems; pulse amplifiers and shapers; pulse generators; wave-form generators; timing circuits; counters and registers; digital computer circuits; transistor pulse circuits. Prerequisite: graduate standing. Credit: 3 q.h. Not offered in 1959-60.

EE 527 DIGITAL COMPUTER TECHNIQUES. Computer arithmetic; coding systems; Boolean algebra; synthesis of logic networks; arithmetic circuits; storage systems; input and output devices. Prerequisite: EE 526. Credit: 3 q.h. Not offered in 1959-60.

EE 529 TRANSISTOR CIRCUITS. Physical principles of transistor and semi-conductor operation; linear representation of transistors; equivalent circuits; application of transistors to low- and high-level amplifiers, oscillators, pulse circuits, voltage and current regulators; and switching circuits. Prerequisite: graduate standing. Credit: 3 q.h. Not offered in 1959-60.

EE 590 MASTER'S THESIS. Research in electrical engineering culminating in the writing of a thesis. Prerequisite: admission to candidacy for degree M.S. in E.E. Credit: 10 q.h. Staff. See 'Thesis Conferences' on p. 4.

ME 521 ADVANCED FLUID MECHANICS I. Incompressible flow; continuity and equations of motion; irrotationality; velocity potential and stream function; sources, sinks, vortex flow, compressible flow concepts; perfect gas; isentropic flow; speed of sound. Prerequisites: graduate standing and an undergraduate course in Fluid Mechanics (such as CE 303). Credit: 3 q.h. Teacher: Ian Fyfe, PhD. Fall Quarter, 6:30-8:00 p.m., M-W, Room A119.

ME 522 ADVANCED FLUID MECHANICS II. Compressible flow continued; one-dimensional flow; wave propagation; oblique shock waves; flow in ducts and wind tunnels; two-dimensional flow; small-perturbation theory; airfoils; Prandtl-Glauret rules. Prerequisite: ME 521. Credit: 3 q.h. Teacher: Dr. Fyfe. Winter Quarter.

ME 523 ADVANCED FLUID MECHANICS III. Topics in two-dimensional compressible flow; methods of characteristics; effects of friction and conductivity; boundary layer theory; unsteady flow. Prerequisite: ME 522. Credit: 3 q.h. Teacher: Dr. Fyfe. Spring Quarter.

ME 531 ELASTICITY AND MECHANICS OF MATERIALS I. Mathematical theory of elasticity; stress and strain tensor; Hooke's generalized law; experimental techniques; stress concentration; strain energy methods. Prerequisite: graduate standing. Credit: 3 q.h. Teacher: Harry Majors, Jr., M.S. Fall Quarter, 6:30-8:00 p.m., T-Th., Room A119.

ME 532 ELASTICITY AND MECHANICS OF MATERIALS II. Continuation of ME 531. Applications of theory to beams, wedges, disks, and curved bars. Photoelasticity. Strain energy methods. Rotating parts. Prerequisite: ME 531. Credit: 3 q.h. Teacher: Mr. Majors. Winter Quarter.

ME 533 ELASTICITY AND MECHANICS OF MATERIALS III. Continuation of ME 532. Failure theories; brittle fracture; introduction to the laws of plasticity. Comparison of plasticity theory with elasticity. Introduction to elastic stability. Prerequisite: ME 532. Credit: 3 q.h. Teacher: Mr. Majors. Spring Quarter.

ME 541 THEORETICAL THERMODYNAMICS AND HEAT TRANSFER I. A rigorous exposition of the First and Second Laws of Thermodynamics. Introduction to thermodynamics of chemistry. Mixtures. Criterion of equilibrium. Prerequisite: ME 523. Credit: 3 q.h. Teacher: Staff. Fall Quarter, 6:30-8:00 p.m., M-W, Room A124.

ME 542 THEORETICAL THERMODYNAMICS AND HEAT TRANSFER II. Mathematical theory of heat conduction in one, two and three dimensions. Unsteady state. Fundamentals of convection. Heat transfer by radiation. Prerequisite: ME 541. Credit: 3 q.h. Winter Quarter.

ME 543 THEORETICAL THERMODYNAMICS AND HEAT TRANSFER III. Heat transfer with change in phase. Interrelationship between flow of heat and fluids. Mass transfer. Extreme temperatures and pressures. High-speed air flow. Prerequisite: ME 542. Credit: 3 q.h. Spring Quarter.

ME 590 MASTER'S THESIS. Research in mechanical engineering or applied mechanics culminating in the writing of a thesis. Prerequisite: admission to candidacy for degree M.S. in M.E. Credit: 10 q.h. Staff. See 'Thesis Conference' on p. 5.

Mt 461 ADVANCED ENGINEERING MATHEMATICS I. (Introduction to Theory of Complex Functions). Complex numbers, analyticity, elementary analytic functions, mapping, integration, series, residues, analytic continuation, Riemann surfaces. Prerequisites: Mt 341 or Mt 433. Credit: 3 q.h. Sec. A, Teacher: Carl DeSilva, Ph.D., Room P404. Sec. B, Teacher: Chu Chiu Chang, MA., Room P454. Fall Quarter, 8:10-9:40 p.m., T-Th.

Mt 462 ADVANCED ENGINEERING MATHEMATICS II. Determinants and matrices, Jacobians, special functions and integrals, Stirling's formula, elliptic integrals, special topics in the theory of linear differential equations (Green's function, method of Frobenius, the equations of Bessel, Legendre and Hermite). Prerequisite: Mt 461. Credit: 3 q.h. Teachers: Dr. DeSilva and Mr. Chang. Winter Quarter.

Mt 463 ADVANCED ENGINEERING MATHEMATICS III. Fourier series and integrals, correlation functions, orthogonal functions, Laplace transform, elements of probability theory, random variables, probability distributions, stochastic processes. Prerequisite: Mt 462. Credit: 3 q.h. Teachers: Dr. DeSilva and Mr. Chang. Spring Quarter.

For descriptions of undergraduate courses, see the Bulletin of Information, 1959-1960. For course offerings and schedules of undergraduate courses each quarter and for schedules of graduate courses for the Winter and Spring Quarters, see the quarterly bulletins of Late Afternoon and Evening Classes issued in the preceding quarter.

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